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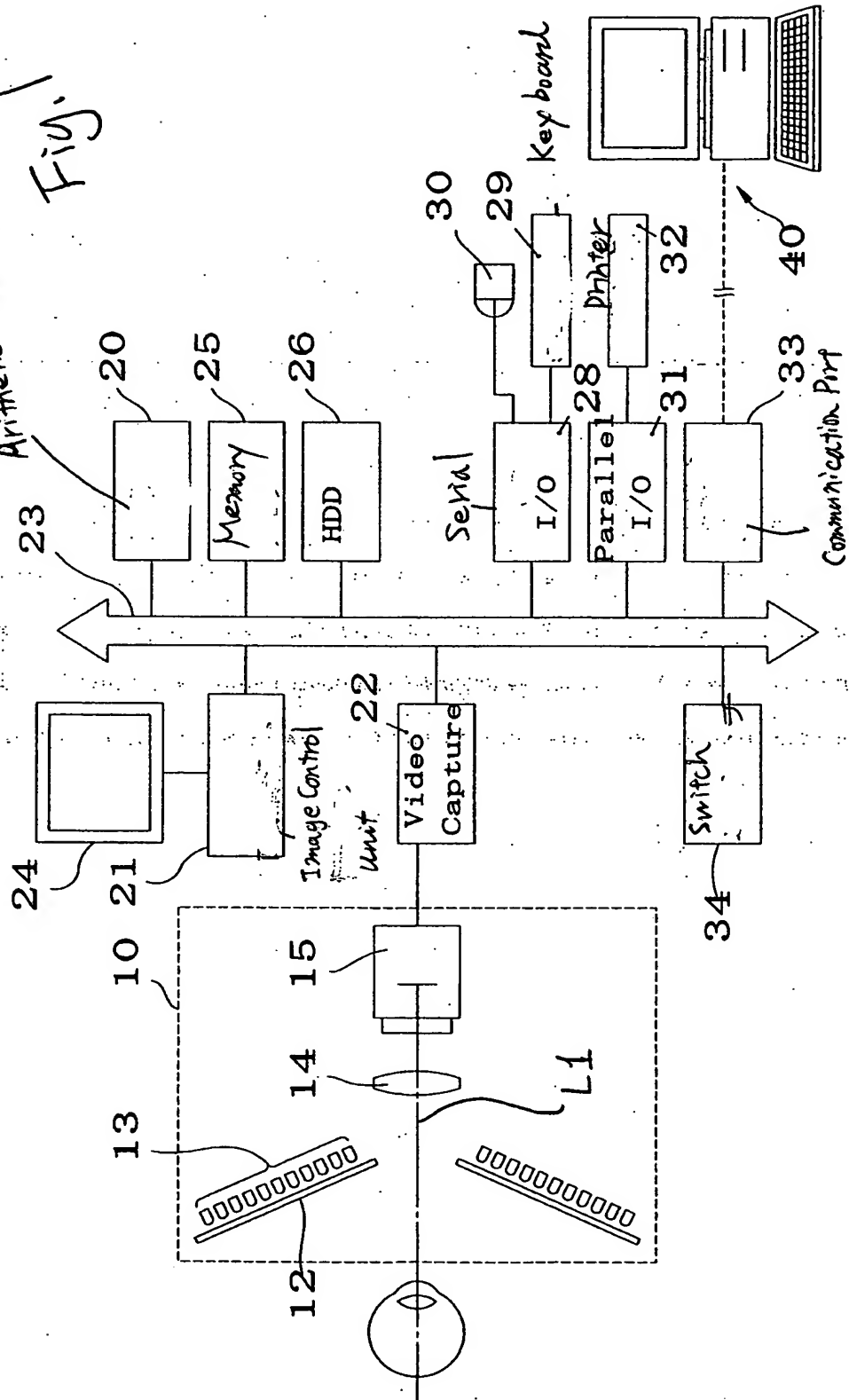
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unit
Arithmetic-and-Control
Fig. 1



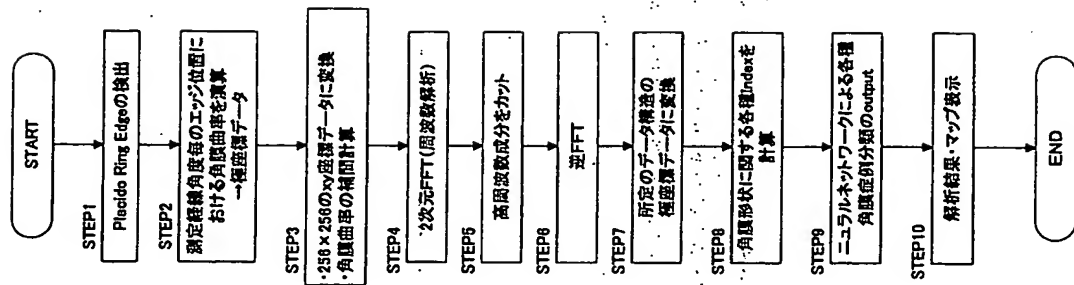


FIG. 2

STEP 1:

DETECT EDGES OF PLACIDO RINGS

STEP 2:

CALCULATE CORNEAL CURVATURE AT EDGE POSITION AT EACH ANGLE OF MEDIANS. CONVERT CURVATURES INTO POLAR COORDINATE DATA.

STEP 3:

CONVERT DATA INTO 256×256 xy-COORDINATE DATA
CALCULATE CORNEAL CURVATURES BY INTERPOLATION

STEP 4:

2D FFT (FREQUENCY ANALYSIS)

STEP 5:

CUT OUT HIGH-FREQUENCY COMPONENTS

STEP 6:

INVERSE FFT

STEP 7:

CONVERT DATA INTO POLAR COORDINATE DATA OF GIVEN DATA STRUCTURE

STEP 8:

CALCULATE INDEXES ABOUT CORNEAL TOPOGRAPHY

STEP 9:

OUTPUTTING OF CLASSIFICATIONS OF CORNEAL TOPOGRAPHIES USING NEURAL NETWORK

STEP 10:

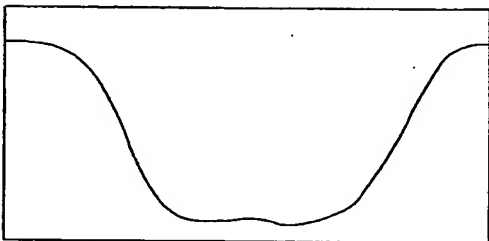
DISPLAY RESULTS OF ANALYSIS AND MAPS

Fig. 3

(a)

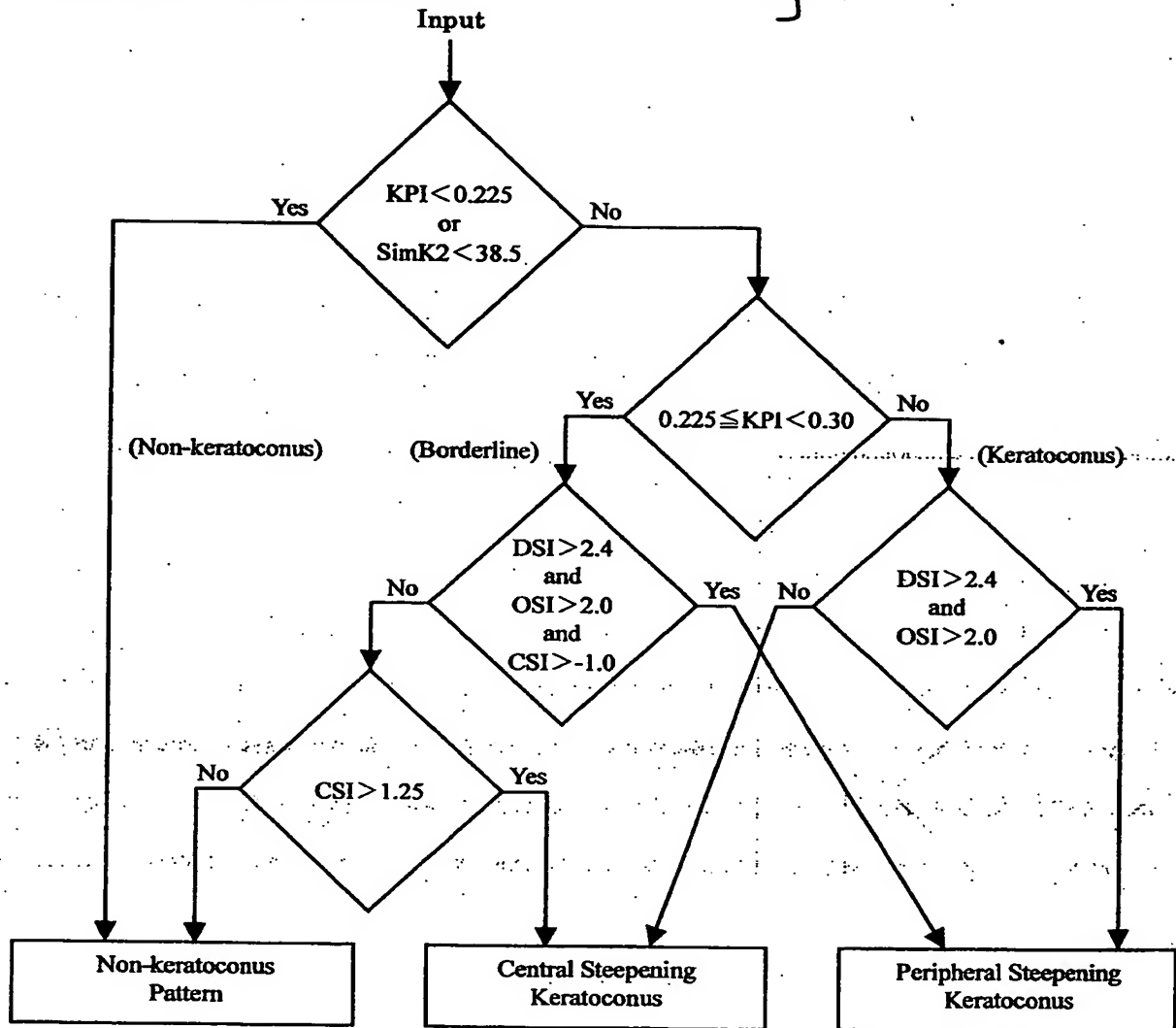


(b)



Binary Decision Tree in Expert System

Fig. 9



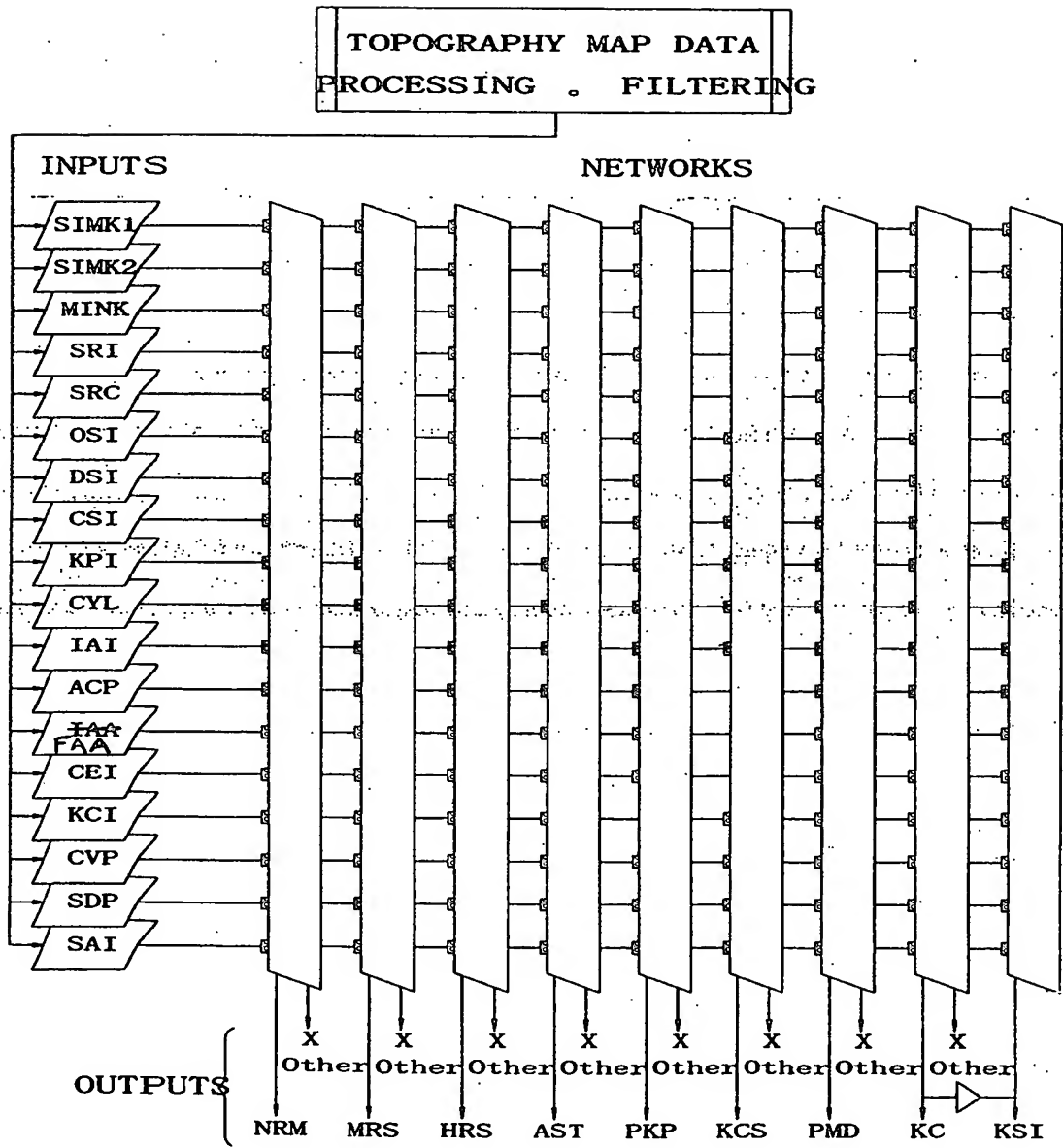
$$KCI = 0.0$$

$$A = \frac{KPI \times 500.0 - 100.0}{100.0}$$

$$KCI = \begin{cases} 0.0 & (-A > 0.0) \\ -A & (-1.0 \leq -A \leq 0.0) \\ -1.0 & (-A < -1.0) \end{cases}$$

$$KCI = \begin{cases} 0.0 & (A < 0.0) \\ A & (0 \leq A \leq 1.0) \\ 1.0 & (A > 1.0) \end{cases}$$

Fig. 5



Graph		Statistics	
	0% 25% 50% 75% 100%		
NRM	0.0%	SRI : 1.94	ACP : 54.86
AST	0.0%	SIMK1: 61.86	IAI : 0.71
KCS	0.0%	SIMK2: 54.07	FAA : 74.96
KC	99.04% KSI-99.04%	MINK : 52.03	KCI : 1.00
PMD	0.0%	OSI : 13.46	CVP : 194.78
PKP	0.1%	DSI : 22.12	SDP : 9.88
MRS	0.2%	CSI : 5.93	SAI : 3.62
HRS	0.0%	KPI : 0.54	CEI : 1.32
OTH	0.3%	CYL : 6.32	SRC : 1.84

FIG. 6

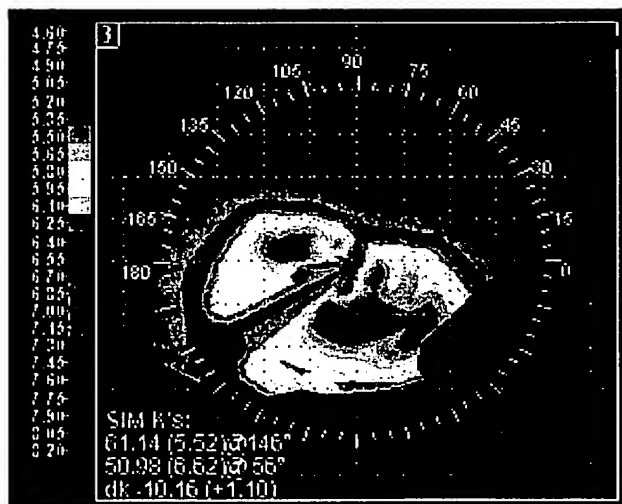


FIG. 7

Fig. 8

$$\begin{aligned} \text{KSI} = & 0.0069 (\text{SIMK1}) + 0.0016 (\text{OSI}) + 0.0220 (\text{SRI}) + 0.0055 (\text{DSI}) + 0.0091 (\text{MINK}) + \\ & -0.0225 (\text{KPI}) + 0.0087 (\text{CYL}) + 0.0144 (\text{IAI}) + -0.0009 (\text{CSI}) + -0.0137 (\text{SAI}) + 0.0489 (\text{SDP}) \\ & + 0.0073 (\text{ACP}) + -0.0032 (\text{CEI}) + 0.0224 (\text{SRC}) + 0.0243 (\text{SIMK2}) + 0.0257 (\text{CVP}) + -0.0737 \\ & (\text{FAA}) + 0.0071 (\text{KCI}) \end{aligned}$$

$$\begin{aligned} \text{KCS} = & -0.2536 (\text{OSI}) + 0.6255 (\text{DSI}) + 0.6087 (\text{KPI}) + 0.0262 (\text{CYL}) + 0.1073 (\text{IAI}) + 0.5513 \\ & (\text{CSI}) + 0.4107 (\text{SAI}) + -0.2324 (\text{SDP}) + -0.1727 (\text{CEI}) + -0.5790 (\text{CVP}) + 0.0054 (\text{KCI}) \end{aligned}$$

$$\begin{aligned} \text{PMD} = & 0.1244 (\text{SIMK1}) + 0.1081 (\text{OSI}) + 0.0785 (\text{SRI}) + 0.0725 (\text{DSI}) + 0.0452 (\text{MINK}) + \\ & 0.0393 (\text{KPI}) + 0.0386 (\text{CYL}) + 0.0167 (\text{IAI}) + 0.0003 (\text{CSI}) + -0.0035 (\text{SAI}) + -0.0153 (\text{SDP}) + \\ & -0.0221 (\text{ACP}) + -0.0321 (\text{CEI}) + -0.0681 (\text{SRC}) + -0.0762 (\text{SIMK2}) + -0.1198 (\text{CVP}) \end{aligned}$$

$$\begin{aligned} \text{PKP} = & 0.0866 (\text{SIMK1}) + 0.0302 (\text{OSI}) + -0.0006 (\text{SRI}) + 0.0028 (\text{DSI}) + -0.0314 (\text{MINK}) + \\ & 0.0583 (\text{KPI}) + 0.0021 (\text{CYL}) + 0.1338 (\text{IAI}) + -0.0459 (\text{CSI}) + -0.0156 (\text{SAI}) + -0.0294 (\text{SDP}) \\ & + -0.0155 (\text{ACP}) + 0.0183 (\text{CEI}) + -0.0121 (\text{SRC}) + 0.0029 (\text{SIMK2}) + -0.0451 (\text{CVP}) + \\ & -0.0033 (\text{FAA}) \end{aligned}$$

$$\begin{aligned} \text{NRM} = & -0.1650 (\text{SIMK1}) + -0.0141 (\text{OSI}) + -0.0519 (\text{SRI}) + -0.2721 (\text{DSI}) + 0.0299 (\text{MINK}) + \\ & 0.2572 (\text{KPI}) + -0.3062 (\text{CYL}) + 0.0255 (\text{IAI}) + 0.1941 (\text{CSI}) + -0.2009 (\text{SAI}) + -0.3098 (\text{SDP}) \\ & + -0.1189 (\text{ACP}) + 0.1186 (\text{CEI}) + -0.0528 (\text{SRC}) + -0.0622 (\text{SIMK2}) + -0.3062 (\text{CVP}) + \\ & -0.0764 (\text{FAA}) + -0.1250 (\text{KCI}) \end{aligned}$$

$$\begin{aligned} \text{MRS} = & -0.0359 (\text{SIMK1}) + 0.0333 (\text{OSI}) + -0.0037 (\text{SRI}) + -0.0078 (\text{DSI}) + 0.0048 (\text{MINK}) + \\ & 0.3986 (\text{KPI}) + -0.0508 (\text{CYL}) + 0.0273 (\text{IAI}) + -0.0286 (\text{CSI}) + 0.0046 (\text{SAI}) + 0.0369 (\text{SDP}) + \\ & -0.0037 (\text{ACP}) + -0.0706 (\text{CEI}) + 0.0567 (\text{SRC}) + 0.0039 (\text{SIMK2}) + -0.0060 (\text{CVP}) + 0.0351 \\ & (\text{FAA}) + -0.0227 (\text{KCI}) \end{aligned}$$

$$\begin{aligned} \text{KC} = & 0.1655 (\text{SIMK1}) + 0.0585 (\text{OSI}) + -0.1228 (\text{SRI}) + 0.0637 (\text{DSI}) + 0.0210 (\text{MINK}) + \\ & 0.1189 (\text{KPI}) + 0.0416 (\text{CYL}) + -0.1346 (\text{IAI}) + 0.1096 (\text{CSI}) + 0.0809 (\text{SAI}) + 0.0325 (\text{SDP}) + \\ & 0.0667 (\text{ACP}) + -0.0499 (\text{CEI}) + -0.0257 (\text{SRC}) + -0.0853 (\text{SIMK2}) + 0.0298 (\text{CVP}) + -0.0237 \\ & (\text{FAA}) + 0.0096 (\text{KCI}) \end{aligned}$$

$$\begin{aligned} \text{HRS} = & -0.1336 (\text{SIMK1}) + -0.1360 (\text{OSI}) + -0.1332 (\text{SRI}) + 0.2551 (\text{DSI}) + 0.2585 (\text{MINK}) + \\ & -0.1508 (\text{KPI}) + -0.4129 (\text{CYL}) + 0.1856 (\text{IAI}) + -0.2606 (\text{CSI}) + -0.2394 (\text{SAI}) + -0.0501 (\text{SDP}) \\ & + -0.1463 (\text{ACP}) + 0.2777 (\text{CEI}) + 0.2931 (\text{SRC}) + 0.1321 (\text{SIMK2}) + -0.0815 (\text{CVP}) + 0.1675 \\ & (\text{FAA}) + -0.1375 (\text{KCI}) \end{aligned}$$

$$\begin{aligned} \text{AST} = & 0.0051 (\text{SIMK1}) + -0.0042 (\text{OSI}) + -0.0012 (\text{SRI}) + 0.0022 (\text{DSI}) + 0.0034 (\text{MINK}) + \\ & -0.0057 (\text{KPI}) + 0.0031 (\text{CYL}) + -0.0029 (\text{IAI}) + 0.0013 (\text{CSI}) + -0.0041 (\text{SAI}) + -0.0054 (\text{SDP}) \\ & + 0.0022 (\text{ACP}) + 0.0039 (\text{CEI}) + -0.0050 (\text{SRC}) + 0.0028 (\text{SIMK2}) + -0.0054 (\text{CVP}) + 0.0021 \\ & (\text{FAA}) + -0.0012 (\text{KCI}) \end{aligned}$$